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PLANETARY PHENOMENA FOR MARCH AND APRIL, 1913.

BY MALCOLM MCNEIL.

PHASES OF THE MOON, PACIFIC TIME.

New Moon	Mar. 7,	$4^h 22^m$ P.M.	New Moon	Apr. 6,	$9^h 48^m$ A.M.
First Quarter.	" 15,	12 58 P.M.	First Quarter..	" 13,	9 39 P.M.
Full Moon	" 22,	3 56 A.M.	Full Moon	" 20,	1 33 P.M.
Last Quarter...	" 29,	4 58 A.M.	Last Quarter ..	" 27,	10 9 P.M.

The first of the eclipses of the year, a total eclipse of the Moon, will occur on the night of March 21st-22d, the beginning visible generally in North America, western South America, throughout the Pacific Ocean, Australia, and the eastern border of Asia; the ending visible generally in western North America, the Pacific Ocean, Australia, central and eastern Asia.

CIRCUMSTANCES OF THE ECLIPSE, PACIFIC TIME.

Moon enters penumbra	March 22,	$1^h 16^m$ A.M.
Moon enters shadow	" 22,	2 13 A.M.
Total eclipse begins	" 22,	3 11 A.M.
Middle of the eclipse	" 22,	3 58 A.M.
Total eclipse ends	" 22,	4 44 A.M.
Moon leaves shadow	" 22,	5 43 A.M.
Moon leaves penumbra	" 22,	6 39 A.M.

The second eclipse, a partial eclipse of the Sun, will occur on April 6th. It will be visible throughout the regions near the North Pole, Alaska, western British America, and the extreme western part of the United States to a point a little south of San Francisco. In the United States and southern Alaska it will be an early morning affair. The American Ephemeris computes the times for Sitka, and gives beginning April 6th, $7^h 35^m$ A. M., and ending $9^h 17^m$ A. M., local mean time, which is almost exactly one hour slow of Pacific time. The maximum obscuration of the Sun is less than one half of its diameter.

The vernal equinox, the time when the Sun crosses the equator from south to north, occurs March 20th, 9 P. M. Pacific time.

Mercury is in fine position for evening observation in early March. On March 1st it sets an hour and three quarters after sunset and the interval remains as great as an hour and one half until about the middle of the month. After that it shortens up very rapidly. The planet reaches greatest east elongation on March 10th. As the planet passed its perihelion only four days earlier, the apparent distance from the Sun, 18° 14′, is much smaller than the average greatest elongation, but it passes the most northerly point in its orbit on March 16th, and it is then more than 9° north of the Sun; so the interval between sunset and the setting of the planet is materially increased. After the middle of the month *Mercury* approaches the Sun very rapidly, passing inferior conjunction and becoming a morning star on March 27th. It reaches greatest west elongation, 27° 12′, on April 24th. This is much larger than the average greatest elongation, as the planet passed its aphelion on April 19th, only five days before; but the planet is now 12° south of the Sun, and the interval between the rising of the planet and that of the Sun scarcely reaches an hour. The conditions for visibility are therefore very poor.

Venus is in fine position for evening observation, setting about four hours after sunset on March 1st and about three hours after on April 1st. After that it approaches the Sun very rapidly and reaches inferior conjunction, becoming a morning star on April 24th. It will then remain a morning star until February 11, 1914. Its eastward motion among the stars gradually diminishes until April 2d, when it becomes stationary, and then moves westward until May 13th. The entire retrograde motion is about 14°. It passes perihelion on March 3d, but the orbit is so nearly circular that this makes very little change in its appearance to us, being in this respect very different from *Mercury* and *Mars*. On March 19th it is at its greatest brightness, being then about half-way between greatest elongation and inferior conjunction; and for some weeks before and after that date it will be visible to the naked eye in full sunlight.

The apparent distance of *Mars* from the Sun is gradually increasing, so that it has now become an easy object to see in the early morning. On March 1st it rises not quite an hour and a half before sunrise, and this interval increases about a quarter of an hour during the two months' period. Its actual distance from the Earth diminishes about twenty-five million miles, and its brightness increases materially, being at the end of April about twice as great as it was on January 1st, although still only 15 per cent as bright as it will be at the next opposition in January, 1914.

Jupiter is gradually drawing farther away from the Sun, and rising earlier, at about three hours before sunrise on March 1st, and at about midnight on April 30th. During the two months' period it moves about 5° eastward in the constellation *Sagittarius,* north and a little east of the "milk dipper."

Saturn is still in good position for evening observation, although it sets much earlier than it did at the beginning of the year. On March 1st it sets shortly after midnight, and at the end of April somewhat before nine o'clock. It moves about 6° eastward and a little northward in the constellation *Taurus,* between the *Pleiades* and the *Hyades* groups. The rings keep about the same opening as during the early part of the year.

Uranus rises shortly five o'clock in the morning in early March and shortly after one at the end of April. It is in the constellation *Capricorn* and moves about 2° eastward during the month.

Neptune is above the horizon until after midnight. It is in *Gemini* south of *Castor* and *Pollux,* the principal stars of the constellation.